CLAIMS

This is a complete and current listing of the claims, marked with status identifiers in parentheses. The following listing of claims will replace all prior versions and listings of claims in the application.

1. (Previously Presented) A method for current measurement at a potential which is at a higher value than zero potential, comprising:

measuring the current value in the form of an analog signal;

transmitting the measured information, after A/D conversion, in the form of a digital signal to an evaluation unit which is at ground potential, wherein

characterized in that the analog signal is subjected to compression before A/D conversion and transmission, and the digital signal is subjected to expansion after transmission at ground potential.

2. (Previously Presented) The method as claimed in claim 1, wherein compression and expansion are effected logarithmically.

3. (Previously Presented) The method as claimed in claim 1, wherein compression and expansion are effected on the basis of the stipulation of root functions.

4. (Previously Presented) The method as claimed in claim 1, wherein temperature compensation is effected.

5. (Previously Presented) The method as claimed in claim 4, wherein the measuring device and shunt are thermally coupled for the purpose of temperature compensation.

6. (Previously Presented) The method as claimed in claim 1, in which, in order to evaluate a measurement signal which, at a higher potential than zero potential, is in the form of an analog value in a measuring device that requires a supply current, having the following measures:

- the compressed information content of the measurement signal is transmitted, after A/D conversion, in the form of a digital signal to the evaluation unit, which is at ground potential, and
- after A/D conversion of the measurement signal, the digital signal produced provides the clock for modulating the supply current, with the result that the modulated supply current for the measuring device likewise performs the function of the carrier for the information content of the measurement signal.

7. (Previously Presented) A circuit arrangement for carrying out the method as claimed in claim 1 for use when measuring the current at a shunt, in which the voltage drop is evaluated as a measure of the current after amplification, said circuit arrangement comprising a shunt, an amplifier for the voltage signal that is tapped off at the shunt, an analog/digital converter, an evaluation unit, means for supplying the measuring components with current, and further means for signal compression and signal expansion.

8. (Previously Presented) The circuit arrangement as claimed in claim 7, further comprising means for temperature compensation.

9. (Previously Presented) The circuit arrangement as claimed in claim 7, wherein a unit for signal compression is connected upstream of the A/D converter.

10. (Previously Presented) The circuit arrangement as claimed in claim 7, wherein the means for signal expansion are integrated in the evaluation unit.

11. (Previously Presented) The circuit arrangement as claimed in claim 8, wherein the means for temperature compensation includes a temperature-dependent reference voltage source.

12. (Previously Presented) The circuit arrangement as claimed in claim 7, further comprising means for at least one of short-circuit disconnection and overload disconnection.

13. (Previously Presented) The circuit arrangement as claimed in claim 12, further comprising a first comparator, which compares the instantaneous value of the current with a first threshold value and produces a signal for short-circuit disconnection when said first threshold value is exceeded.

14. (Previously Presented) The circuit arrangement as claimed in claim 12, further comprising a second comparator, which compares the instantaneous temperature of the load with a second threshold value and outputs a signal for overload disconnection when said second threshold value is exceeded.

15. (Previously Presented) The circuit arrangement as claimed in claim 14, further comprising a thermal model of the load, said model being used to ascertain the instantaneous temperature of the load from the current measured.

16. (Previously Presented) The method as claimed in claim 2, wherein temperature compensation is effected.

17. (Previously Presented) The circuit arrangement as claimed in claim 7, wherein the means for signal expansion are integrated in the evaluation unit in the existing microcontroller, in the form of software.

18. (Previously Presented) A circuit arrangement for current measurement at a shunt, at a potential which is at a higher value than zero potential, wherein a voltage drop is evaluated as a measure of the current after amplification, the circuit arrangement comprising:

an amplifier for amplifying a voltage signal that is tapped off at the shunt;

an analog/digital converter for converting the amplified signal subjected to compression before A/D conversion;

an evaluation unit, which is at ground potential, wherein the digital signal is subjected to expansion after transmission at ground potential; and

means for performing the compression and expansion.

19. (Previously Presented) The circuit arrangement as claimed in claim 18, further comprising means for temperature compensation.

20. (Previously Presented) The circuit arrangement as claimed in claim 18, wherein the means for signal expansion are integrated into the evaluation unit.